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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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HARNESSE, DICKEY & PIERCE, P.L.C.

P.O. BOX 828

BLOOMFIELD HILLS, MI 48303

EXAMINER

QI, ZHI QIANG

ART UNIT

PAPER NUMBER

2871

DATE MAILED: 07/14 2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/863,059

Examiner

Mike Qi

Applicant(s)

KAWAKAMI ET AL.

Art Unit

2871

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on 11 June 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) 1 and 3-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) 1 and 3-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 3-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 2000-98415 (Mitsuru).

Claim 1, Mitsuru discloses (col.1, line 45 – col.3, line 47; Figs.1-6) a structure of liquid crystal display device comprising:

- a liquid crystal panel (10) (generally, the liquid crystal panel has a pair of substrates that holds the liquid crystal);
- a light guide (7) provided opposite to one of the substrates;
- a flexible wiring board (9) (flexible substrate) connected to one of the substrates;
- a light emitting diode (3) (light emitting device) mounted on the flexible wiring board (9) (flexible substrate) and the flexible substrate (9) is bent to a light receiving surface (7a) of the light guide (7).

Mitsuru does not expressly disclose that the light emitting device (LED) is mounted to the light receiving surface of the light guide.

However, Mitsuru discloses (Fig.1) that the light emitting diode (3) is mounted on the flexible substrate (9) and facing to the light receiving surface (7a) of the light guide

(7). According to the common knowledge, in order to use the light efficiently, the best method must be to mount the LED into the light receiving surface of the light guide, so that the light emitted from the LED would be efficiently coupled into the light guide so as to improve the light utilization while improve the display brightness.

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to mount light emitting device to the light receiving surface of the light guide as claimed in claim 1 for improving the display brightness.

Claims 3-5, Mitsuru discloses (col.1, line 45 – col.3, line 47; Figs.1-2) that the flexible wiring board (9) (flexible substrate) has a terminals (2) connected to one of the LCD panel substrates, and the light emitting diode (3) is provided on the same surface of the flexible wiring board (9) as the surface where the terminal (2) is provided.

The wiring pattern can be provided either on the side opposite to the LED or on the side of the LED. Because the wiring can be arranged on the both sides of the flexible substrate and that was conventional.

If the wiring pattern is provided on the side opposite to the LED, the wiring connection for the terminal wiring and the LCD panel must be through a through hole, and that would have been at least obvious for achieving the electrical connections being as short as possible. If the wiring pattern is provide on the side of the LED, the wiring connection for the terminal wiring and the LCD panel must avoid the light emitting device such as LED, and that would have been at least obvious for achieving the electrical connections being as short as possible.

Claim 6, Mitsuru discloses (col.1, line 45 – col.3, line 47; Fig.1) that the light emitting surface (a) is at the side of the mounted surface of the light emitting device (3) to the flexible wiring board (9) (flexible substrate), and the light emitting surface (a) is mounted facing to the light receiving surface (7a) of the light guide (7). According to the common knowledge, in order to use the light efficiently, the best method would be to mount the LED into the light receiving surface of the light guide, so that the light emitted from the LED would be efficiently coupled to the light guide so as to improve the light utilization while improve the display brightness, and that would have been at least obvious.

Claims 7, Mitsuru discloses (col.1, line 45 – col.3, line 47; Figs.5-6) a conventional liquid crystal display (as shown in Figs.5-6) in which the light guide (7) is formed in a bend shape so that the light receiving surface faces a direction opposite to the LCD panel substrates, and the light emitting surface of the light emitting diode (3) is mounted to the light receiving surface facing a direction opposite to the LCD panel substrates (see Fig.5b).

Mitsuru discloses in Figs. 5-6 that is a conventional structure, and Mitsuru discloses in Fig.1 that the light emitting diode can be mounted on the flexible wiring board (9). The light emitting device is mounted on the flexible substrate in different positions according to the different embodiments such as the light guide is formed opposite to a substrate or is formed in a bend shape that would have been an obvious variations, because the light emitting device must be facing to the light receiving surface of the light guide.

Claims 8, Mitsuru discloses (col.1, line 45 – col.3, line 47; Figs.1-6) that the flexible wiring board (9) (flexible substrate) has a drive driver (4) (driving circuit for supplying signal) for driving the liquid crystal.

3. Claims 9-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 2000-98415 (Mitsuru) in view of US 6,315,440 (Satoh).

Claim 9, Mitsuru discloses (col.1, line 45 – col.3, line 47; Figs.1-6) that a structure of liquid crystal display device comprising:

- a liquid crystal panel (10) (generally, the liquid crystal panel has a pair of substrates that holds the liquid crystal);
- a light guide (7) provided opposite to one of the substrates;
- a flexible wiring board (9) (flexible substrate) connected to one of the substrates;
- a light emitting diode (3) (light emitting device) mounted on the flexible substrate (9) and the flexible substrate (9) is bent along a light receiving surface (7a) of the light guide (7);
- the light emitting diode (3) is mounted on the flexible substrate (9).

Mitsuru does not expressly disclose that the light emitting device is mounted to the light receiving surface, and the positioning means are provided between the light emitting device and the light receiving surface of the light guide for mounting the light emitting device to the light receiving surface of the light guide.

However, Mitsuru discloses (Fig.1) that the light emitting diode (3) is mounted on the flexible substrate (9) and facing to the light receiving surface (7a) of the light guide

(7). According to the common knowledge, in order to use the light efficiently, the best method must be to mount the LED into the light receiving surface of the light guide, so that the light emitted from the LED would be efficiently coupled into the light guide so as to improve the light utilization while improve the display brightness.

Satoh discloses (col.4, line 28 – col.5, line 21; Figs.2-3) a liquid crystal display using flexible substrate (21), and two positioning through holes (26) provided on the forward end side of the flexible substrate (21) are respectively fitted to two positioning bosses (27) provided erectly on the back side of the holding member (22), so that the flexible substrate (21) is positioned. Although the positioning means is for positioning the flexible substrate (21) to the holding member (22), but that is the same principle for positioning the light emitting device such as LED to the light guide, and the two parts would be correspondently engaged together (the LEDs would be the positioning bosses and the recesses on the light receiving surface of the light guide would be the positioning through holes). To position two parts using positioning means such as one part having projections and the other part having corresponding recesses so as to engage the two parts together (like a male part and a female part engaged together) was a conventional, and using such positioning means correspondently engage the LEDs with the light guide would increase the light utilization efficiency (minimizing the light lose).

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to design a positioning means for mounting the light emitting device as claimed in claim 9 for achieving the correspondently mounting the light emitting

device to the light receiving surface of the light guide so as to increase the light utilization efficiency, and improving the display brightness.

Claims 10-11, Satoh discloses (col.4, line 28 – col.5, line 21; Figs.2-3) using two positioning through holes (26) (recessed portion) and positioning bosses (27) (projecting portion) as the positioning means so as to engage the two parts in a liquid crystal display, and using projection on one part and using recess on the other part as the positioning means would have been at least obvious. The projecting portion using cylindrical pin or triangular prism or any other shape such as rounded top projection, etc., that would have been at least an obvious variations.

Claim 12, Mitsuru discloses (col.1, line 45 – col.3, line 47; Fig.1) that the flexible wiring board (9) (flexible substrate) is bend along the light receiving surface (7a) of the light guide (7) so that the light emitting device (3) is facing to the light receiving surface (7a).

Claims 13-15, Mitsuru discloses (col.1, line 45 – col.3, line 47; Figs.1-2) that the flexible wiring board (9) (flexible substrate) has a terminals (2) connected to one of the LCD panel substrates, and the light emitting diode (3) is provided on the same surface of the flexible wiring board (9) as the surface where the terminal (2) is provided. The wiring pattern can be provided either on the side opposite to the LED or on the side of the LED. Because the wiring can be arranged on the both sides of the flexible substrate and that would have been at least obvious. If the wiring pattern is provided on the side opposite to the LED, the wiring connection for the terminal wiring and the LCD panel must be through a through hole, and that would have been at least obvious. If the wiring

pattern is provide on the side of the LED, the wiring connection for the terminal wiring and the LCD panel must avoid the light emitting device such as LED, and that would have been at least obvious.

Claim 16, Mitsuru discloses (col.1, line 45 – col.3, line 47; Fig.1) that the light emitting surface (a) is at the side of the mounted surface of the light emitting device (3) to the flexible wiring board (9) (flexible substrate), and the light emitting surface (a) is mounted facing to the light receiving surface (7a) of the light guide (7). According to the common knowledge, in order to use the light efficiently, the best method would be to mount the LED into the light receiving surface of the light guide, so that the light emitted from the LED would be efficiently coupled to the light guide so as to improve the light utilization while improve the display brightness, and that would have been at least obvious.

Claim 17, Mitsuru discloses (col.1, line 45 – col.3, line 47; Figs.5-6) a conventional liquid crystal display (as shown in Figs.5-6) in which the light guide (7) is formed in a bend shape so that the light receiving surface faces a direction opposite to the LCD panel substrates, and the light emitting surface of the light emitting diode (3) is arranged opposite to the light receiving surface facing a direction opposite to the LCD panel substrates (see Fig.5b).

Mitsuru discloses in Figs. 5-6 that is a conventional structure, and Mitsuru discloses in Fig.1 that the light emitting diode can be mounted on the flexible wiring board (9). The light emitting device is mounted on the flexible substrate in different positions according to the different embodiments such as the light guide is formed

opposite to a substrate or is formed in a bend shape that would have been an obvious variations, because the light emitting device must be facing to the light receiving surface of the light guide.

Claim 18, Mitsuru discloses (col.1, line 45 – col.3, line 47; Figs.1-6) that the flexible wiring board (9) (flexible substrate) has a drive driver (4) (driving circuit for supplying signal) for driving the liquid crystal.

Claim 19, concerning an electronic device using a liquid crystal device as claimed in claim 1 such as a flexible substrate connected to a control circuit to control the operation of the liquid crystal and a light emitting device is arranged opposite to the light receiving surface of a light guide that would be only given weight as intended use. Because any display can be used for an electronic device, and that would have been at least obvious.

Response to Arguments

4. Applicant's arguments filed on June 11, 2003 have been fully considered but they are not persuasive.

Applicant's **only** arguments are as follows:

1) the reference Mitsuru does not disclose the light emitting diode (3) is mounted to the light receiving surface (7a) of the light guide, and there is a gap between the light emitting diode (3) and the light receiving surface (7a).

2) the claims 7 and 17, the reference Mitsuru (Figs. 5a, 5b) do not disclose the light emitting diode (3) is mounted onto the flexible substrate (9).

3) the references do not disclose the positioning means for mounting the light emitting device to the light receiving surface of the light guide.

Examiner's responses to Applicant's **only** arguments are as follows:

1) the reference Mitsuru discloses (Fig.1) that the light emitting diode (3) is mounted on the flexible substrate (9) and facing to the light receiving surface (7a) of the light guide (7). According to the common knowledge, in order to use the light efficiently, the best method must be to mount the LED into the light receiving surface of the light guide, so that the light emitted from the LED would be efficiently coupled into the light guide so as to improve the light utilization while improve the display brightness.

2) Mitsuru discloses in Figs. 5-6 that is a conventional structure, and Mitsuru discloses in Fig.1 that the light emitting diode can be mounted on the flexible wiring board (9). The light emitting device is mounted on the flexible substrate in different positions according to the different embodiments such as the light guide is formed opposite to a substrate or is formed in a bend shape that would have been an obvious variations, because the light emitting device must be facing to the light receiving surface of the light guide.

3) Satoh discloses (col.4, line 28 – col.5, line 21; Figs.2-3) a liquid crystal display using flexible substrate (21), and two positioning through holes (26) provided on the forward end side of the flexible substrate (21) are respectively fitted to two positioning bosses (27) provided erectly on the back side of the holding member (22), so that the flexible substrate (21) is positioned. Although the positioning means is for positioning the flexible substrate (21) to the holding member (22), but that is the same principle for

positioning the light emitting device such as LED to the light guide, and the two parts would be correspondently engaged together (the LEDs would be the positioning bosses and the recesses on the light receiving surface of the light guide would be the positioning through holes). To position two parts using positioning means such as one part having projections and the other part having corresponding recesses so as to engage the two parts together (like a male part and a female part engaged together) was a conventional, and using such positioning means correspondently engage the LEDs with the light guide would increase the light utilization efficiency (minimizing the light lose).

Conclusion

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

Art Unit: 2871

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mike Qi whose telephone number is (703) 308-6213.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Mike Qi
June 26, 2003


TOANTON
PRIMARY EXAMINER